

Report to Congress

**1997 Annual Report on
Low-Level Radioactive Waste
Management Progress**



U.S. Department of Energy
Office of Environmental Management
Washington, DC 20585

November 1998

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The Secretary of Energy
Washington, DC 20585

December 11, 1998

The Honorable Al Gore
President of the Senate
Washington, D.C. 20510

Dear Mr. President:

Enclosed is the "1997 Annual Report on Low-Level Radioactive Waste Management Progress," submitted in response to section 7(b) of the Low-Level Radioactive Waste Policy Act. This is the twelfth annual report submitted by the Department of Energy on national and State activities related to the development of new disposal capacity for commercially-generated low-level radioactive waste.

At the end of 1997, seven states in six compacts or proposed compacts continued to pursue the development of new disposal facilities at different rates and schedules. Operations continued at the disposal facility in South Carolina for Class A, B, and C commercial low-level radioactive waste generated across the Nation (except for North Carolina) as well as at a disposal facility in Utah for certain types of low-level radioactive waste. Also operational was the Richland, Washington, commercial disposal facility that serves the Northwest and Rocky Mountain compact regions. In general, however, most states remained concerned about the long-term availability of existing disposal capacity and continued to monitor national events concerning the development of new disposal capacity.

Since the 1997 reporting period, there have been several notable developments. On February 5, 1998, the New Jersey Low-Level Radioactive Waste Disposal Facility Siting Board voted to suspend the current siting process in that state. On August 5, 1998, Nebraska officials issued their intent to deny a license for construction and operation of the proposed regional disposal facility in Boyd County, Nebraska. Legislation was enacted September 20, 1998, giving consent to the low-level radioactive waste compact entered into by Texas, Maine, and Vermont (Public Law 105-236). However, on October 22, 1998, the Texas Natural Resource Conservation Commission denied the license application for the proposed Texas compact regional disposal facility.



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The Department of Energy continues to provide technical assistance to State agencies and compact organizations on a wide range of activities related to low-level radioactive waste management. If you have further questions, please contact me or have a member of your staff contact Mr. John C. Angell, Assistant Secretary for Congressional and Intergovernmental Affairs, at (202) 586-5450.

Yours sincerely,

A handwritten signature in black ink, reading "Bill Richardson" with a stylized flourish at the end.

Bill Richardson

Enclosure

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Report to Congress

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U.S. Department of Energy
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ABSTRACT

The Low-Level Radioactive Waste Policy Act, 1980 (Public Law 96-573), as amended by the Low-Level Radioactive Waste Policy Amendments Act of 1985 (Public Law 99-240), states as Federal policy that commercial low-level radioactive waste can be most safely and effectively managed by states on a regional basis. The law encourages states to enter into regional compacts for low-level radioactive waste disposal by offering compacts approved by Congress the authority to restrict use of their regional disposal facilities to waste generated within the respective regions. (The current configuration of compacts is shown in Figure 1 at the end of the report.)

This report is prepared pursuant to Section 7(b) of the Act which requires the Department of Energy (DOE) to “prepare and submit to Congress on an annual basis a report which summarizes the progress of low-level waste disposal siting and licensing activities within each compact region,” and to review other topics related to the management and disposal of low-level radioactive waste. This is the twelfth annual report prepared in response to the Act. The report summarizes the 1997 calendar year activities concerning progress toward the establishment of new disposal facilities for commercially-generated low-level radioactive waste. The report emphasizes significant issues and events that have affected progress in developing new disposal facilities, and also includes an introduction that provides background information and perspective on United States policy for low-level radioactive waste disposal.

EXECUTIVE SUMMARY

The Low-Level Radioactive Waste Policy Act, 1980 (Public Law 96-573), as amended by the Low-Level Radioactive Waste Policy Amendments Act of 1985 (Public Law 99-240), established as Federal policy that commercial low-level radioactive waste can be most safely and effectively managed by states on a regional basis. The law encourages states to enter into regional compacts for low-level radioactive waste disposal by offering compacts approved by Congress the authority to restrict use of their regional disposal facilities to waste generated within the respective regions. (The current configuration of compacts is shown in Figure 1 at the end of the report.)

The legislation included a series of incentives and penalties to encourage states to develop new low-level radioactive waste disposal capacity by certain dates. The “take title” provision required states to take title to, and assume all liability for low-level radioactive waste within their borders should they not provide for disposal by 1996. This “take title” provision was found unconstitutional by the Supreme Court in 1992, but severable from the remainder of the Act. Although it has been suggested that this decision has impacted some states’ pursuit of new disposal capability, specific documentation to that effect is lacking.

Section 7(b) of the Act requires the Department of Energy to “prepare and submit to Congress on an annual basis a report which summarizes the progress of low-level waste disposal siting and licensing activities within each compact region,” and reviews other topics related to the management and disposal of low-level radioactive waste. This is the twelfth annual report prepared in response to the Act.

At the end of 1997, seven states in six compacts or proposed compacts continued to pursue the development of new disposal facilities at different rates and schedules. Private sector interest in developing new disposal facilities may offer future alternatives to meet market demands for waste management services. In 1995, the State of South Carolina opened the Barnwell facility to waste generators nationwide (except for North Carolina). The same year, the Envirocare site, a privately developed disposal facility in western Utah, announced that it would expand its acceptance of lower activity commercial Class A low-level radioactive wastes. The Utah facility has been accepting various types of DOE and Federal cleanup wastes. Other companies have also initiated efforts to establish new radioactive waste disposal facilities, though some of these appear to be intended to accept only DOE waste. The role of proposed private facilities in meeting generator demand for disposal capacity remains to be determined.

In many states and compact regions, there is some doubt that existing disposal facilities will continue to provide stable, long-term access to disposal capacity for a reasonable period of time. The status of the South Carolina facility has changed several times over the past decade which leaves long-term availability uncertain. The Utah site, even if a pending expanded license amendment is granted, can accept only Class A low-level radioactive waste with limited radionuclide concentrations.

Last year's report observed that compact host states continued their site development efforts while unaffiliated states had taken official actions to slow or suspend their processes. In 1997, for the first time, siting programs in two compact host states, Illinois and Ohio, were also suspended or discontinued. Illinois, host state for the Central Midwest Compact, announced that it would defer siting activities to coincide with the predicted increase in commercial low-level radioactive waste volumes, expected with the onset of power reactor decommissioning in 2012. The Midwest Compact Commission halted siting activities in Ohio, noting substantially decreasing waste volumes, increasing disposal facility development costs, and the availability of disposal capacity outside the region.

Licensing activities continued in 1997 in three states. Texas continued administrative processes in support of upcoming hearings on a 1992 license application for the proposed facility in Hudspeth County. The Texas compact legislation (to approve a proposed compact among Texas, Maine, and Vermont) is nearing completion in Congress. On October 29, 1997, the Nebraska Low-Level Radioactive Waste Program issued draft documents following the state's seven-year review of a license application submitted for a proposed facility in Boyd County. The documents contained no preliminary or tentative conclusions on whether the state would approve or disapprove a license for the facility. The documents contained 152 detailed technical findings, 123 of which found the license application acceptable and 29 of which found the license application unacceptable. The Program was to have received public comment on the findings through February 4, 1998, and, as follow-up, planned to issue a decision on the proposed license application, which will also be subject to public comment. Throughout 1997, discussions continued among the Southeast Compact Commission, the State of North Carolina, and regional waste generators on ways to pay for completion of site investigations and construction of the proposed facility in North Carolina. Unable to reach agreement, the North Carolina Low-Level Waste Management Authority voted on December 19 to "begin the orderly shutdown of the project pending the Compact's reversal of its funding position or receipt of other instructions from the North Carolina Legislature."

As in previous years, considerable national attention during 1997 was focused on progress in California. In 1993, the state became the first since 1970 to issue an operating license for a new low-level radioactive waste disposal facility. The site is located on public domain land managed and administered by the U.S. Bureau of Land Management (BLM) in Ward Valley in the Mojave Desert. Construction of the facility has been delayed pending the necessary land transfer to the State of California. Issues related to the land transfer led, in 1997, to two lawsuits against the Federal Government, one by the State of California and one by US Ecology, the State's licensed site developer. At year's end, the litigation was still underway.

Last year's report listed several significant activities and decision points that, alone or collectively, have the potential to significantly influence the shape of future low-level radioactive management in the U.S. These mileposts are repeated in Table A-1 below, along with their status as of the end of 1997.

Table A-1: Status of key mileposts in the development of disposal capacity

MILEPOSTS	STATUS
A decision whether or not to transfer the Ward Valley site to California	Terms of land transfer still under negotiation; lawsuits filed against Federal Government
Approval or lack of approval by Congress of the proposed Texas Compact	The compact legislation is nearing completion in Congress.
Outcome of the Texas adjudicatory hearings on the draft license and the environmental and safety analysis	Hearings scheduled for 1998
A decision by Nebraska whether to grant or to deny an operating license for the proposed facility in Boyd County	"Findings" issued, but no draft license decision. Proposed decision should follow evaluation of public comments in 1998
Clear positive or negative results from the new studies of the proposed North Carolina site	Site investigation activities on hold due to impasse over funding. At year's end, discussions of funding options continue.
Clarification regarding whether currently operating disposal facilities will be able to provide stable, long-term access to disposal	Unresolved. Future of South Carolina facility could be impacted by ability of site operator to pay state disposal taxes. Future of Utah site might be affected by outcome of investigations and lawsuits. Possibility of success of other private sector efforts too early to judge.

The table indicates that none of the anticipated key decision points noted in last year's annual report was resolved during 1997, and that events during 1998 are expected to affect the future direction for management and disposal of low-level radioactive waste.

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1997 Annual Report to Congress on Low-Level Radioactive Waste Management Progress

INTRODUCTION

Section 7(b) of the Low-Level Radioactive Waste Policy Act, 1980 (Public Law 96-573), as amended by the Low-Level Radioactive Waste Policy Amendments Act of 1985 (Public Law 99-240) (Act), requires the Department of Energy to:

“...prepare and submit to Congress on an annual basis a report which (1) summarizes the progress of low-level waste disposal siting and licensing activities within each compact region, (2) reviews the available volume reduction technologies, their applications, effectiveness, and costs on a per unit volume basis, (3) reviews interim storage facility requirements, costs, and usage, (4) summarizes transportation requirements for such wastes on an inter- and intra-regional basis, (5) summarizes the data on the total amount of low-level waste shipped for disposal on a yearly basis, the proportion of such wastes subjected to volume reduction, the average volume reduction attained, and the proportion of wastes stored on an interim basis, and (6) projects the interim storage and final disposal volume requirements anticipated for the following year, on a regional basis.”

This is the twelfth annual report prepared in response to the Act. The report documents progress in establishing new disposal facilities for low-level radioactive waste, and focuses on issues that may affect progress. The final section of this report addresses the other topics specified in the Act.

LOW-LEVEL RADIOACTIVE WASTE POLICY THROUGH 1997

United States policy on the disposal of commercially-generated low-level radioactive waste has evolved through several distinct periods. In the 1950's, the Atomic Energy Commission (AEC), predecessor agency to the Department of Energy, disposed of radioactive wastes generated by the few organizations outside the agency that were licensed to possess nuclear materials. The AEC also licensed commercial firms

to dispose of radioactive waste at sea. In 1960, at the urging of companies in the private sector, the AEC announced that it would license land disposal facilities, and would phase out the use of AEC facilities for disposal of commercially-generated low-level radioactive waste.

At about the same time, states began to assume authority for licensing and regulating the possession of certain radioactive materials and low-level radioactive waste, as part of the “agreement state” program under a 1959 amendment to the Atomic Energy Act of 1954 (Section 274). These actions launched the era of state-regulated, private sector responsibility for the disposal of low-level radioactive waste. In the 1960's and 1970's, six commercially-operated disposal facilities were licensed to operate: Beatty, Nevada (1962-1992); West Valley, New York (1963-1975); Maxey Flats, Kentucky (1963-1977); Richland, Washington (1965--); Sheffield, Illinois (1968-1978); and Barnwell, South Carolina (1971--).

The performance of these disposal sites varied. Three sites closed prematurely for failure to meet required standards. Reasons cited for the closures include inadequate operational practices, unstable and inappropriate waste forms, and unsuitable geological conditions. In 1982, the Nuclear Regulatory Commission promulgated comprehensive regulations designed to address each of the siting, operations, closure, and waste form issues, as well as institutional issues related to long-term financial assurance and public confidence. By this time, however, many policy makers began to believe that the private sector would not be able to establish new disposal facilities to replace those that had closed. Concerned that the remaining three disposal sites might be required indefinitely to meet the national demand for disposal capacity, political leaders in the host states of Nevada, South Carolina, and Washington urged the enactment of Federal legislation that would allow states to enter into compact regions for disposal of low-level radioactive waste.

The Low-Level Radioactive Waste Policy Act, enacted late in 1980, established a national policy on state responsibility to manage commercial low-level radioactive waste and encouraged states to form regional compacts. The law offered compacts approved by Congress the authority to limit low-level radioactive waste disposal to waste generated within the respective regions beginning in 1986. This law initiated an era of state responsibility for the disposal of low-level radioactive waste. Although seven compacts were submitted to Congress for approval between 1983 and 1985, Congress did not immediately approve them. As time elapsed, it appeared unlikely that new disposal sites could be established by 1986, potentially leaving many generators without access to disposal capacity.

After a series of negotiations, the states and compact regions agreed to a compromise that became the Low-Level Radioactive Waste Policy Amendments Act of 1985. Access to the three operating facilities was extended through 1992. More stringent site development milestones were enacted. Supporters of the legislation believed the milestones would lead to the establishment of new disposal sites by 1993, or, at the latest, 1996. The final milestone required that any state unable to provide for disposal after 1995 “take title” to the waste or assume liability for all damages incurred by a generator as a consequence of the failure of the state to take title.

Following enactment of the Federal law, states made substantial efforts to establish new disposal sites. From 1982 through 1987, nine compact regions were formed, host states chosen, enabling legislation enacted, and site development programs begun. (The current configuration of compacts is shown in Figure 1, at the end of the report.) To date, however, no new disposal facilities have been established.

A number of factors combined to delay the creation of new capacity--including political opposition and new technical and expanded public involvement requirements adopted by the U.S. Nuclear Regulatory Commission and specific states. In addition, other events affected the pace at which states moved to develop disposal facilities, e.g., a decision by the U.S. Supreme Court abrogating the “take title” provision of the Act, and the renewed availability of disposal capacity at commercially-operated facilities.

In 1995, South Carolina enacted legislation extending the operating life of the Barnwell disposal facility in that state and making the facility available to waste generators nationwide (except those located in North Carolina). During this same time period, a facility in Utah, previously permitted for disposal of naturally occurring radioactive materials, obtained a license for disposal of low-level radioactive waste containing limited concentrations of specific radionuclides within the Class A waste category.

The expiration of site development incentives in section 5(d)(2)(8)(b) of the Act, the striking of the “take title” provision in the Act, and the renewed availability of disposal capacity have caused some political leaders to reexamine their efforts to develop new disposal facilities. Others, however, are concerned that the South Carolina site may not remain available and that limits may be placed on the kinds of waste accepted at the Utah facility, and therefore that state/compact programs to establish stable, long-term disposal capacity are still needed.

The status of state programs to develop new low-level radioactive waste disposal facilities is shown in Table 1.

Table 1: Status of state programs to establish new disposal facilities

California (<i>Southwestern</i>)	License issued; development of facility awaiting transfer of land from Federal government
Texas (<i>proposed Texas/Maine/Vermont compact</i>)	Notice of favorable licensing decision; final approval pending adjudicatory hearings
Nebraska (<i>Central</i>)	License application review completed, with both “acceptable” and “unacceptable” findings; proposed license decision pending public comment period and public hearings on final evaluation document
North Carolina (<i>Southeast</i>)	Site investigation activities on hold, pending resolution of issues related to project funding
Connecticut (<i>Northeast</i>), New Jersey (<i>Northeast</i>), Pennsylvania (<i>Appalachian</i>)	Programs to seek volunteer sites officially ongoing
Illinois (<i>Central Midwest</i>), Massachusetts , Michigan , New York , Ohio (<i>Midwest</i>)	Site development process officially discontinued, suspended or slowed for specific reasons and schedule commitments
Colorado (<i>Rocky Mountain</i>)	Site development effort discontinued due to long-term access contract with the Northwest compact
District of Columbia* , New Hampshire , Puerto Rico* , Rhode Island	Did not initiate site development program or join compact

**Defined as states in the Act*

KEY ACTIVITIES IN STATES AND COMPACTS

Compact regions cease or delay siting efforts

During 1997 two compact regions took steps to cease or to suspend their site development programs. In doing so, they join several unaffiliated states that have taken similar actions over the past several years.

Illinois, host state for the two-state Central Midwest Compact, enacted legislation on June 26, 1997, that effectively delays the target date for disposal facility operations until the year 2012, to coincide with increased waste volumes expected to be generated during decommissioning of nuclear power reactors in the state. A background statement issued by the Illinois Department of Nuclear Safety in support of the policy pointed out that it would not be economically viable to operate a disposal facility for the compact region until waste volumes increase with the commencement of power reactor decommissioning. The policy statement notes that any new disposal facility would still have to meet site criteria that was developed during the current process. It observes also that the additional time will permit the development and implementation of a voluntary siting process.

On June 26, 1997, the Midwest Compact Commission passed a resolution to indefinitely cease development activities for a regional disposal facility. The resolution also revoked "all previous resolutions that designated, selected, or confirmed host states for the first regional disposal facility." It, therefore, revoked the Commission's 1991 designation of Ohio as host state for the six-state region. The resolution cited several reasons for taking the action. It noted dramatically declining waste volumes in the Midwest region, escalating costs for site development observed in other regions, the current availability of disposal capacity, and the early stage of site development within the region where significant expenditures have not yet been incurred. As a result of the decision, the offices of the Ohio Low-Level Radioactive Waste Authority closed September 30, 1997.

Status of Proposed Texas, Maine, Vermont Compact

On October 7, 1997, the U.S. House of Representatives approved the Texas Compact. The Texas Compact, comprised of Texas, Maine, and Vermont, had been submitted for Congressional approval in each

of the past three years. In addition to the terms of Congressional consent accompanying the eight previous low-level radioactive waste disposal compacts, the Congressional consent language for the Texas compact bill specifies that Congressional consent "is granted only for so long as no low-level radioactive waste is brought into Texas from any state other than Maine or Vermont." The legislation is nearing completion in Congress.

In March 1996, the Executive Director of the Texas Natural Resources Conservation Commission recommended to the Commission issuance of an operating license for a proposed low-level radioactive waste disposal facility in Hudspeth County. During 1997, activities related to administrative hearings on the recommendation and supporting documentation, including discovery and depositions, continued. The hearings on the recommendation were scheduled to begin early in 1998.

Nebraska agency culminates technical review of license application

On October 29, 1997, the Nebraska Low-Level Radioactive Waste Program (a partnership between the Department of Environmental Quality and the Department of Human Services Regulation and Licensure) issued two draft documents related to the Central Interstate Compact Commission's proposed disposal facility in Boyd County. Issuance of the Draft Safety Evaluation Report and the Draft Environmental Impact Assessment was the culmination of a review process that has been underway since the license application was first filed in 1990. The draft documents contain no preliminary licensing decision, but will constitute the technical basis for a future licensing decision.

The draft Safety Evaluation Report (SER) contains 152 detailed technical findings, 123 of which found the facility "acceptable," and 29 of which found the facility "unacceptable." The management of the Central Compact Commission indicated that they were encouraged that an independent performance assessment conducted by the Nebraska Program for the SER indicated annual doses less than regulatory limits. The Nebraska Program announced that written public comment on the reports would be accepted through February 4, 1998. A public hearing is scheduled to take place in Boyd County, Nebraska, from February 2 to February 5, 1998.

Following evaluation of written comments and comments obtained through public hearings, the agencies plan to issue their final evaluation reports along with a proposed license decision to grant or deny the license application. The proposed decision will be open to another public comment period and public hearing before the agencies issue a final license decision.

North Carolina activities on hold

Discussions in the Southeast Compact region during 1997 focussed on funding to complete characterization studies at the proposed regional disposal site in Wake County, North Carolina. Funding available from the Southeast Compact Commission is not sufficient to complete the studies and the associated license application review, and North Carolina political leaders have indicated their reluctance to provide significant additional funding from general revenues. North Carolina estimates that approximately \$75 million will be needed for facility construction, once a license is approved.

On August 21, 1997, the Southeastern Low-Level Radioactive Waste Compact Utilities Group, comprised of most of the region's nuclear utilities, presented a proposal under which the Compact Commission and regional waste generators would provide the necessary funding in exchange for certain conditions and guarantees. The Compact Commission agreed to the proposal in concept. It made release of further funding after November 30 contingent upon North Carolina's agreement in principle to the proposal or to an alternative proposal acceptable to the Utilities Group. Agencies of the State of North Carolina, however, were unable to support the proposal, citing provisions related to the assumption of debt by state agencies and other concerns.

On December 19, 1997, the North Carolina Low-Level Radioactive Waste Management Authority voted to "begin the orderly shutdown of the project pending the Compact's reversal of its funding position or receipt of other instructions from the North Carolina Legislature." At year's end, the Authority had taken steps to begin shutting down the project, although discussions continued among the parties over ways to resolve the funding impasse.

California continues efforts to acquire land for disposal site

In 1993, California became the first state since 1970 to issue an operating license for a new low-level radioactive waste disposal facility. Previous annual reports have described California's efforts to acquire the land on which the proposed disposal facility is located from the Bureau of Land Management (BLM) under the Department of the Interior (DOI). These activities continued throughout 1997.

A 1995 report by the National Academy of Sciences had recommended, among other things, that an additional study be conducted of tritium movement in the disposal facility environment to validate earlier work on this subject. The recommendation suggested the additional work would be accomplished during construction and development of the site. Considerable discussion during 1997 centered on who should conduct the study and when. At year's end, protocols for conducting the study were still under review by DOI. California completed plans to collect samples and requested a permit from BLM to begin the activity. DOE agreed to allow the Lawrence Livermore National Laboratory to provide technical assistance to the State of California and to DOI in analyzing samples collected during the study based on requests from both parties.

In January 1997, the State of California and US Ecology filed lawsuits against the United States. The California suit seeks a court order requiring DOI to transfer the land to the State. The US Ecology suit seeks monetary damages for DOI's alleged breach of contract in not completing the land transfer process that was formally commenced in early 1992. In February, California joined the US Ecology suit, and US Ecology filed a second suit against the United States similar to the suit filed previously by the State of California. The courts in both cases have received motions for summary judgment and have asked for cross motions. Decisions on the motions are expected in early 1998.

In July 1997, the General Accounting Office issued a report critical of DOI's handling of the land transfer issue. Congressional proponents of the land transfer have indicated that they will continue efforts to transfer the land through Federal legislation; however, the legislation has not advanced to date.

States continue voluntary siting programs

Three states, Connecticut, New Jersey, and Pennsylvania, continued programs in 1997 to attract communities to volunteer to host disposal facilities. Efforts in Connecticut focused on continued evaluation of assured isolation (described elsewhere in this report) as an alternative to traditional disposal. In the latter half of 1997, the New Jersey Low-Level Radioactive Waste Siting Board held discussions with the Economic Development Commission of Carneys Point township regarding the volunteer process. On December 22, however, the Carneys Point Township Committee voted 4 to 1 to discontinue participation in the process.

NATIONAL HIGHLIGHTS

Emergence of private sector proposals for new disposal facilities

Interest increased in 1997 in several private sector initiatives to establish new disposal facilities for low-level radioactive waste outside the traditional compact system. New private sector facilities have been proposed in Texas, Colorado, and Utah. While the proposed Texas and Colorado facilities have no plans to accept waste from commercial generators and instead focus on the disposal of DOE waste, the developments suggest that private sector companies might also be able to establish new disposal facilities for commercially-generated waste.

On April 24, 1997, Laidlaw Environmental Services announced its intent to seek a license to dispose of lower activity low-level radioactive waste and naturally occurring radioactive material (NORM), including waste from commercial generators, at its "Grassy Mountain" facility in Utah. Located in Tooele County west of the Great Salt Lake, the Grassy Mountain site is currently permitted to accept industrial and hazardous wastes, and PCB's (polychlorinated biphenyls). If the current effort is successful, the facility will be able to dispose of NORM and low-level radioactive waste with limited concentrations of specific radionuclides in a synthetically-lined trench that was initially planned for hazardous waste. The cell, a 10-acre facility that can accommodate approximately 20 million cubic feet of waste, would have to be modified to meet state requirements for low-level radioactive waste disposal.

As required by Utah regulations, Laidlaw submitted a "siting plan application" to the State of Utah

and applied for local planning and zoning authorization. At year's end, the siting plan application was still under review. If the company receives approval of the siting plan application, the company will file a license application with the State. In November and December, the Tooele County Planning Commission rejected Laidlaw's request for local planning and zoning authorization. The Company plans to appeal the decisions to the Tooele County Commission on January 13, 1998. Should the County reject the proposal, the company has indicated it will consider a judicial remedy. Utah law also requires approval of the facility by the Governor and State legislature.

Revision of South Carolina disposal fees

South Carolina enacted legislation in 1995 that allowed the Barnwell disposal facility in the State to continue operating, and also imposed a state tax of \$235 per cubic foot on all waste disposed at the facility. In 1997, the South Carolina legislature amended the method for computing the tax, effective retroactively to the fiscal year beginning July 1, 1996, and ending on June 30, 1997. In addition to the volume-based tax on waste disposed, the new formula assesses a contingent annual license tax on "any company" operating a low-level radioactive waste disposal facility in the state. Under the license tax formula, the disposal site operator must make up the shortfall in revenue that is annually required to fund the State's Higher Education Scholarship grants.

Chem-Nuclear Systems, L.L.C., the company operating the disposal site, met the target goal for 1997. For fiscal year 1998 (ending June 30, 1998), 343,412 cubic feet of waste would be required in order to meet the \$23 million grant fund goal. Half way through the fiscal year, indications are that volumes will fall short of that amount. This has left the company with a task in meeting the potential shortfall for this fiscal year, and the challenge of devising a system to ensure that the revenue requirements are met in future years.

Late in the year, Chem-Nuclear announced that it would attempt to sell in advance between 5 and 7 million cubic feet of disposal capacity (of the estimated 7.9 million cubic feet remaining) for use over the next 25 years. Purchasers would also be required to pay a nominal incremental surcharge designed to make up for the expected revenue shortfall for the current fiscal year. If the company receives commitments to purchase a

sufficient volume, it plans to recommend to the state legislature that the new arrangement be substituted for the current revenue structure. Chem-Nuclear plans to conduct the sale of the capacity in mid-January 1998.

If Chem-Nuclear is unable to raise funds adequate to pay the state license tax for fiscal year 1998, or if the State of South Carolina does not approve the plan, company officials have indicated that they will have to look for alternative ways to meet the revenue requirements, including a general increase in disposal fees.

Status of disposal capacity in Utah

Litigation continues to surround the western Utah disposal site operated by Envirocare. The site continues to operate under license from the State of Utah and license renewal is under consideration as an action separate from any litigation. An expansion of the license is also being considered that would encompass most of the radionuclides within the Class A category. Resolution of the litigation, completion of license reviews and other administrative actions are expected to be resolved in 1998. This will facilitate a better prediction of the future role of this low-level waste disposal facility to accommodate the needs of generators.

Interest grows in new approaches and methods

The difficulty in establishing new disposal facilities and the uncertainty of continued access to existing disposal sites have contributed to interest in alternative approaches and methods for long-term management of low-level radioactive waste. Ideas discussed during the year included the consolidation of the systems for managing and disposing of defense and non-defense waste; assured isolation as an alternative to traditional near-surface disposal; and a proposal to allow low-level radioactive waste from nuclear power reactor decommissioning to be permanently isolated by entombment within the reactor containment building.

A unified system for low-level radioactive waste management. One proposal that generated discussion in 1997 was for the establishment of a single "unified" system for treatment and disposal of low-level radioactive waste. Unlike many other nations, the U.S. has maintained two systems for radioactive waste management, one for DOE and nuclear weapons-related defense waste, and one for commercial and non-defense waste. Some state officials have expressed interest in using DOE facilities for the treatment of relatively small volumes of commercially-generated mixed waste that cannot be treated by available private

sector facilities. At the same time, DOE has begun to explore the possibility of using private sector facilities for treatment and disposal of defense waste.

Advocates for a unified system have urged more explicit recognition of these activities and trends, and more deliberate plans for merging the two systems. Such proposals have not been reviewed with the Governors of states hosting DOE facilities. DOE host states have generally been opposed to the import of any additional DOE waste for disposal and would not likely be supportive of adding commercial waste streams to the inventory of waste for disposal within their states. The Department has invested substantial time and resources in negotiating acceptable arrangements for the management of DOE wastes with the states hosting DOE facilities. These efforts have been in response to the requirements of the Federal Facility Compliance Act, and other commitments made to Governors including environmental impact analyses at each site. Also included in these efforts has been substantial negotiation with many publics ranging from local citizen advisory boards to the National Governors' Association.

Assured isolation of low-level radioactive waste. This concept of low-level waste management relies on credit for engineered barriers and institutional controls as opposed to characterization of a site to assess the capability of natural barriers in isolating waste from the environment. While the environmental impact statement for the current disposal regulations (10 CFR Part 61) was modeled upon shallow land burial of radioactive waste as practiced in the late 1970's, states and DOE installations in the eastern U.S. have shifted to the use of manufactured vaults, typically located above the natural grade of the earth's surface.

In the absence of any site characterization to assess natural barriers in isolating the waste, the concept of assured isolation (or assured storage) requires the use of accessible above-grade vaults to allow inspection of waste packages for any failures. Monitoring nearby wells for evidence of groundwater contamination is the design methodology to detect any migration from the facility. Proponents of the concept believe that such facilities could be safely operated at more locations than traditional disposal sites and allow them co-location with existing nuclear facilities. While proponents believe that the ability to continually inspect the structural integrity of the facility might help reduce public concerns over the long-term performance, critics of the concept are uncomfortable with the extensive reliance on active human maintenance to ensure successful isolation of the waste, and doubt that the proposal would alleviate public concerns.

Entombment of low-level radioactive waste. With an increasing number of nuclear power reactors facing decommissioning, the NRC has accelerated its efforts to resolve decommissioning issues. On July 21, 1997, the NRC published in the Federal Register (62 FR 39057) the final rule on Radiological Criteria for License Termination, which had been under development for several years.

In early 1996, the Florida Public Service Commission and the Department of Health and Rehabilitative Services wrote to the NRC and questioned the basis for the Commission's apparent preference for dismantlement of power reactors as described in a 1995 Federal Register Notice (60 FR 37374). The Florida agencies urged the NRC to consider entombment of nuclear power reactors as an acceptable alternative.

In April 1997, in response to the NRC's Strategic Assessment and Rebaselining Initiative, the Commission directed that the NRC staff, "describe the technical requirements and regulatory actions which would be necessary for entombment to be a viable decommissioning option." With entombment, low-level radioactive waste that accumulated during decommissioning of the power reactor would be emplaced within the fortified reactor containment building, and the building would serve as the final resting place for the material. An NRC staff response to the directive is expected within the first several months of 1998.

Few utilities are actively examining entombment as a decommissioning option. Current NRC policies place significant restrictions on use of this option.

OTHER ANNUAL REPORT TOPICS

In addition to summarizing the progress of siting and licensing activities within the states, the Act requires the Department of Energy to report annually on several other specific topics.

Volume reduction technologies

Virtually all low-level radioactive waste received at the South Carolina and Washington sites today is treated or stabilized in some manner prior to disposal. In addition to improving the waste form, many waste treatment technologies result in significant reductions in the volume of waste requiring disposal. Treatment may take place at large, centralized commercial facilities, or at the place of generation using smaller scale treatment facilities or mobile units.

In 1996, the Department of Energy's National Low-Level Waste Management Program published the report, "Commercially Available Low-Level Radioactive and Mixed Waste Treatment Technologies" (DOE/LLW-240, available through the Program's home page at: <http://www.inel.gov/national/national.html>). The report discusses the various forms of low-level radioactive waste and indicates which are amenable to commercially available treatment technologies. The technologies include sizing, compaction, filtration, decontamination, evaporation, separation, incineration, vitrification, immobilization/stabilization, metal recovery, and physical and chemical treatments.

Because the number of such technologies does not change significantly from year to year, DOE did not update the report during 1997. During 1998, DOE plans to update the information in the report and convert it into an electronic file available at the Internet address provided above.

Transportation requirements

In September 1995, the Department of Transportation, in cooperation with the Nuclear Regulatory Commission, published a final rule in the Federal Register ("Hazardous Materials, Transportation Regulations; Compatibility with Regulations of the International Atomic Energy Administration," 60 FR 50292) on offsite transportation of radioactive materials, which includes low-level radioactive waste. The purpose of the rule was to bring United States radioactive material transportation requirements in line with International Atomic Energy Agency standards, and to provide a more uniform degree of safety for various types of waste shipments. Most provisions of the new rule became effective April 1, 1996.

Among other changes, the new rule revises the requirements for shipping “low specific activity” (LSA) material, which is radioactive material that does not exceed specific concentrations. A large portion of low-level radioactive waste meets the requirements to be shipped as LSA material. The new rule divides LSA material into three categories requiring levels of industrial packaging rated from 1 to 3, with 3 being the most secure. Because the new rule lowers the radionuclide concentration levels subject to LSA packaging, the rule could require such packaging for a substantial volume of contaminated soils and uranium mill tailings that previously could be shipped as unpackaged bulk materials. The new regulations also required the use of the international system of units for the measurement of radioactivity, effective April 1, 1997.

Interim storage requirements

Section 5(b) of the Act, that was added by the Low-Level Radioactive Waste Policy Amendments Act of 1985, allowed the three states with operating disposal sites to limit the volume of waste accepted at those sites between 1986 and 1992. The Act refers to this period as the “interim access period.” It also limited the volume of waste each nuclear power reactor could ship for disposal during that period. Because of these limits, Congress believed that many waste generators might be forced to store significant amounts of waste until new regional disposal facilities were established.

Although no new low-level radioactive waste disposal facilities have been built, the reopening of the South Carolina disposal facility and availability of the Utah facility, for certain low-level radioactive wastes, have alleviated the need for most waste generators to provide on-site storage. Currently only waste generators in North Carolina, barred by South Carolina state law from shipping waste to the Barnwell facility, are required to store some low-level radioactive waste on site.

While some waste generators choose to store their waste rather than ship it for disposal, the amounts are not believed to be significant. Neither the Nuclear Regulatory Commission, the Department of Energy, the Electric Power Research Institute, nor the Nuclear Energy Institute routinely collects and compiles data on the amount of low-level radioactive waste stored on site at the place where it was generated. The Institute for Nuclear Power Operation (INPO) collects survey information from nuclear power reactors, but has not compiled the information on the amount of low-level radioactive waste stored on site.

On September 5, 1997, a Diplomatic Conference of the International Atomic Energy Agency approved the "Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management." Among its reporting requirements, signatories to the agreement must provide an inventory of applicable low-level radioactive waste that is being held in storage, has been disposed, or "has resulted from past practices." At year's end, DOE and the NRC, signatories to the Convention on behalf of the United States, were discussing approaches for complying with the reporting requirements.

Interim storage and disposal requirements for the forthcoming year

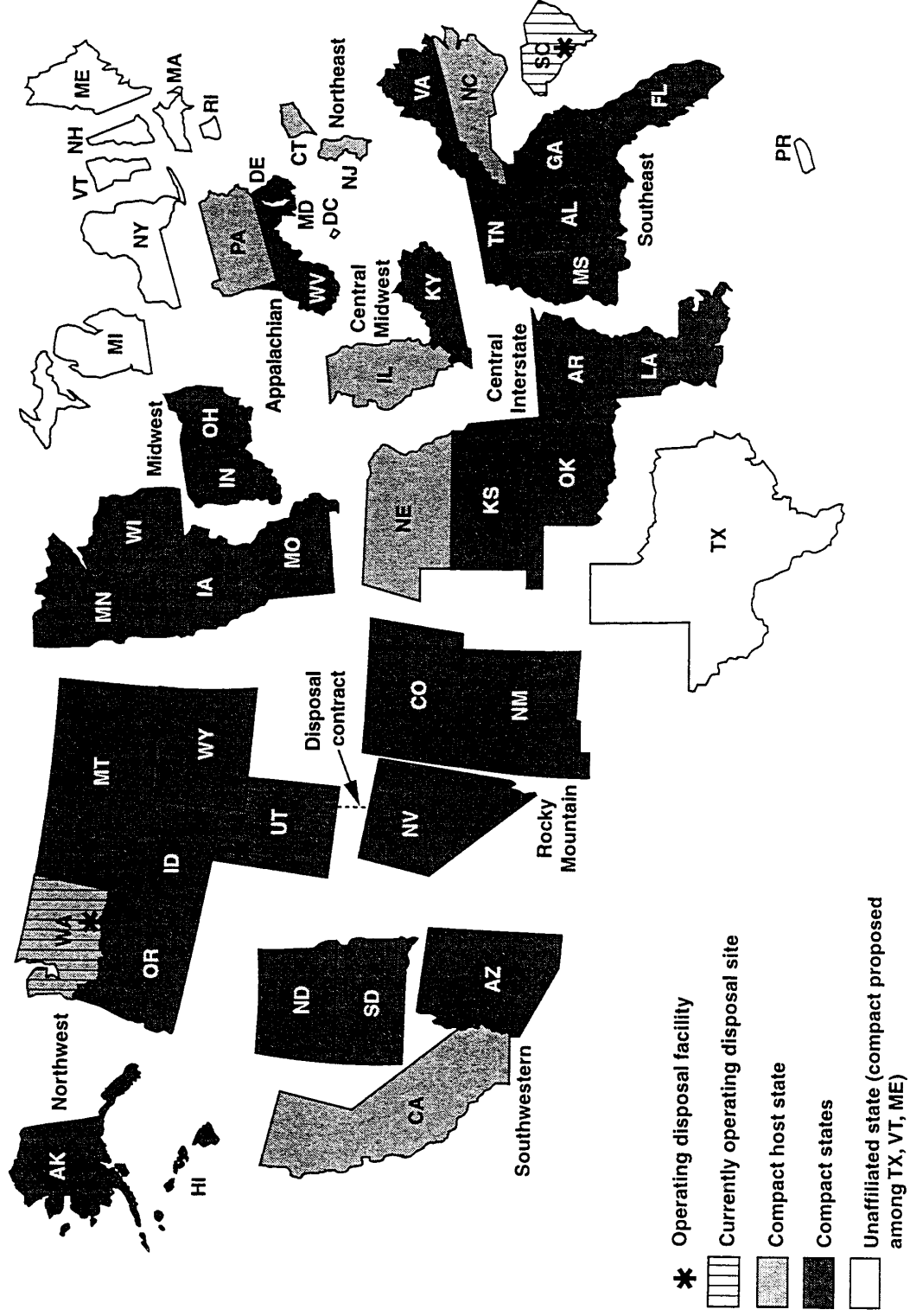
The Department of Energy does not collect data for projecting disposal requirements for the upcoming year. The economics of data collection would likely be far in excess of the benefits derived from the data. Generators of commercial low-level radioactive waste are regulated by the Nuclear Regulatory Commission and various state agencies, rather than the Department of Energy. With the significant amount of volume reduction that has taken place over the past decade, acceptance of all the Nation's waste does not pose operational problems for the Nation's currently operating disposal sites. In 1997, the South Carolina and Washington sites together received approximately 313,000 cubic feet of waste for disposal, down from 471,000 cubic feet the previous year. In 1985, the same two disposal sites received over 2,600,000 cubic feet of waste. In addition, the Envirocare site is also now available for disposal of certain Class A low-level radioactive wastes.

Disposal facilities for the full range of Class A, B, and C low-level radioactive waste are available to waste generators in all states except North Carolina. Therefore, with the exception of North Carolina generators, organizations that store low-level radioactive waste do so for reasons unrelated to the availability of disposal capacity.

Waste shipped for disposal

The National Low-Level Waste Management Program's Manifest Information Management System provides detailed information on low-level radioactive waste shipped for disposal. This system is accessible on the Program's Internet home page at <http://www.inel.gov/national/national.html>. The Department also provides data on the volumes and categories of low-level radioactive waste shipped for disposal on an annual basis in the report, the "State-by-State Assessment of Low-Level Radioactive Waste Shipped for Disposal." The report for 1996, document number DOE/LLW-243, was issued in September 1997. The annual data report for calendar year 1997 is scheduled to be published in September 1998.

Figure 1: Commercial Low-Level Waste Disposal Regions



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